Claim

1. A multilayered printed circuit board comprising:
a conductor circuit and a resin insulating layer serially formed on a substrate in alternate fashion and in repetition;
and a solder resist layer formed as an outermost layer,
wherein said solder resist layer contains an inorganic filler.

2. The multilayered printed circuit board according to claim 1,
wherein said inorganic filler is at least one member selected from the group consisting of an aluminum compound, a calcium compound, a potassium compound, a magnesium compound and a silicon compound.

3. The multilayered printed circuit board according to claim 1 or claim 2,
wherein said inorganic filler has a particle diameter within a range from 0.1 to 5.0 μm.

4. The multilayered printed circuit board according to any of claims 1 to 3,
wherein said solder resist layer contains an elastomer.

5. A solder resist composition to be used for manufacturing the multilayered printed circuit board according to any of claims 1 to 4,
wherein an inorganic filler is mixed with a paste containing a resin for a solder resist layer.

6. A method for manufacturing a multilayered printed circuit board comprising:
a conductor circuit and a resin insulating layer serially formed on a substrate in an alternate fashion and in repetition;

and a solder resist layer formed as an outermost layer,

wherein the solder resist composition according to claim 5 is used.

7. (Amended) A multilayered printed circuit board comprising: a conductor circuit and a resin insulating layer serially formed on a substrate in an alternate fashion and in repetition; and a solder resist layer formed as an outermost layer,

wherein said solder resist layer contains an elastomer component in a composition comprising a resin for said solder resist layer.

8. The multilayered printed circuit board according to claim 7,

wherein said elastomer component is at least one member selected from the group consisting of natural rubber, synthetic rubber, a thermoplastic resin and a thermosetting resin.

9. The multilayered printed circuit board according to claim 7 or claim 8,

wherein said elastomer component is separated in micro-phase as to form an island-in-sea structure after curing in said solder resist layer.

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~~10. The multilayered printed circuit board according to any~~ of claims 7 to 9,

~~wherein said solder resist layer contains an inorganic filler.~~

11. The multilayered printed circuit board according to claim 10,

wherein said inorganic filler is at least one compound selected from the group consisting of an aluminum compound, a calcium compound, a potassium compound, a magnesium compound, and a silicon compound.

12. (Cancelled)

13. (Cancelled)

14. A multilayered printed circuit board comprising:
a conductor circuit and a resin insulating layer serially formed on a substrate in an alternate fashion and in repetition; and a solder resist layer formed as an outermost layer,
wherein said solder resist layer has a dielectric constant of 3.0 or lower at 1 GHz.

15. A multilayered printed circuit board comprising:
a conductor circuit and a resin insulating layer serially formed on a substrate in an alternate fashion and in repetition; and a solder resist layer formed as an outermost layer,
wherein said solder resist layer is comprising a polyolefin type resin.

16. The multilayered printed circuit board according to claim 15,
wherein said solder resist layer has a dielectric constant of 3.0 or lower at 1 GHz.

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17. The multilayered printed circuit board according to any of claims 14, 15 or 16,
wherein said solder resist layer has a dielectric loss tangent of 0.01 or lower at 1 GHz.

18. The multilayered printed circuit board according to any of claims 14 to 17, wherein said solder resist layer is comprising a cycloolefin type resin.

19. The multilayered printed circuit board according to claim 18, wherein said cycloolefin type resin is a homopolymer or a copolymer of a monomer comprising 2-norbornene, 5-ethylidene-2-norbornene or their derivatives.

20. The multilayered printed circuit board according to claims 18 or claim 19, wherein said cycloolefin type resin is a thermosetting cycloolefin type resin.

21. The multilayered printed circuit board according to any of claims 14 to 20, wherein said resin insulating layer is comprising a polyolefin type resin or a polyphenylene type resin.

22. A semiconductor device comprising:

a multilayered printed circuit board wherein a conductor circuit and a resin insulating layer are serially formed on a substrate in an alternate fashion and in repetition, and a solder resist layer having a solder bump is formed as an uppermost layer; and

an IC chip connected with said multilayered printed circuit board through said solder bump,

wherein said solder resist layer is comprising a polyolefin type resin and said resin insulating layer is comprising a polyolefin type resin, a polyphenylene type resin or a fluoro type resin.

23. A multilayered printed circuit board comprising: a conductor circuit and a resin insulating layer serially formed on a substrate in an alternate fashion and in repetition; and a solder resist layer formed as an outermost layer,

wherein said solder resist layer has a dielectric loss tangent of 0.01 or lower at 1 GHz.

24. A multilayered printed circuit board comprising: a conductor circuit and a resin insulating layer serially formed on a substrate in an alternate fashion and in repetition; and a solder resist layer formed as an outermost layer,

wherein said solder resist layer is comprising a polyphenylene ether resin.

25. The multilayered printed circuit board according to claim 24,

wherein said solder resist layer has a dielectric loss tangent of 0.01 or lower at 1 GHz.

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26. The multilayered printed circuit board according to any of claims 23, 24 or 25,

wherein said solder resist layer has a dielectric constant of 3.0 or lower at 1 GHz.

27. The multilayered printed circuit board according to any of claims 24, 25 or 26,

wherein said polyphenylene ether resin is a thermosetting type polyphenylene ether resin and/or thermoplastic type polyphenylene ether resin.

28. The multilayered printed circuit board according to any of claims 23 to 27,

wherein said resin insulating layer is comprising a polyphenylene ether resin.

29. A semiconductor device comprising:

a multilayered printed circuit board wherein a conductor circuit and a resin insulating layer are serially formed on a substrate in an alternate fashion and in repetition, and a solder resist layer having a solder bump is formed as an uppermost layer; and

an IC chip connected with said multilayered printed circuit board through said solder bump,

wherein said solder resist layer is comprising a polyphenylene ether resin and said resin insulating layer is comprising a polyphenylene ether resin, a polyolefin type resin or a fluoro type resin.

30. A multilayered printed circuit board comprising: a conductor circuit and a resin insulating layer serially formed on a substrate in an alternate fashion and in repetition and a solder resist layer formed as an outermost layer,

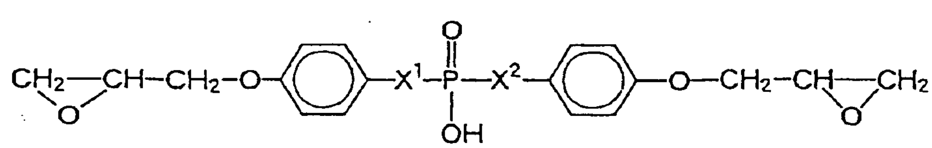
wherein said solder resist layer contains a P atom-containing epoxy resin.

31. The multilayered printed circuit board according to claim 30,

wherein said P atom-containing epoxy resin has bivalent phosphoric acid residue, and has epoxy groups in both terminals.

32. The multilayered printed circuit board according to claim 31,

wherein said epoxy resin having bivalent phosphoric acid residue and having epoxy groups in both terminals is an epoxy resin having the following general formula [4]



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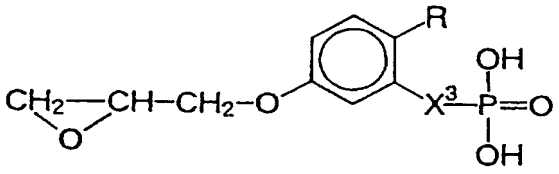
(wherein X^1, X^2 respectively represent O or a single bond).

33. The multilayered printed circuit board according to claim 30,

wherein said P atom-containing epoxy resin is an epoxy resin having a monovalent phosphoric acid residue in one terminal and an epoxy group in the other terminal.

34. The multilayered printed circuit board according to claim 33,

wherein said epoxy resin having a monovalent phosphoric acid residue in one terminal and an epoxy group in the other terminal is an epoxy resin having the following general formula [5]:



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: represents).

35. The multilayered printed circuit board according to any of claims 30 to 34,

wherein said solder resist layer contains at least one member selected from the group consisting of a silicon compound, an aluminum compound and a magnesium compound.